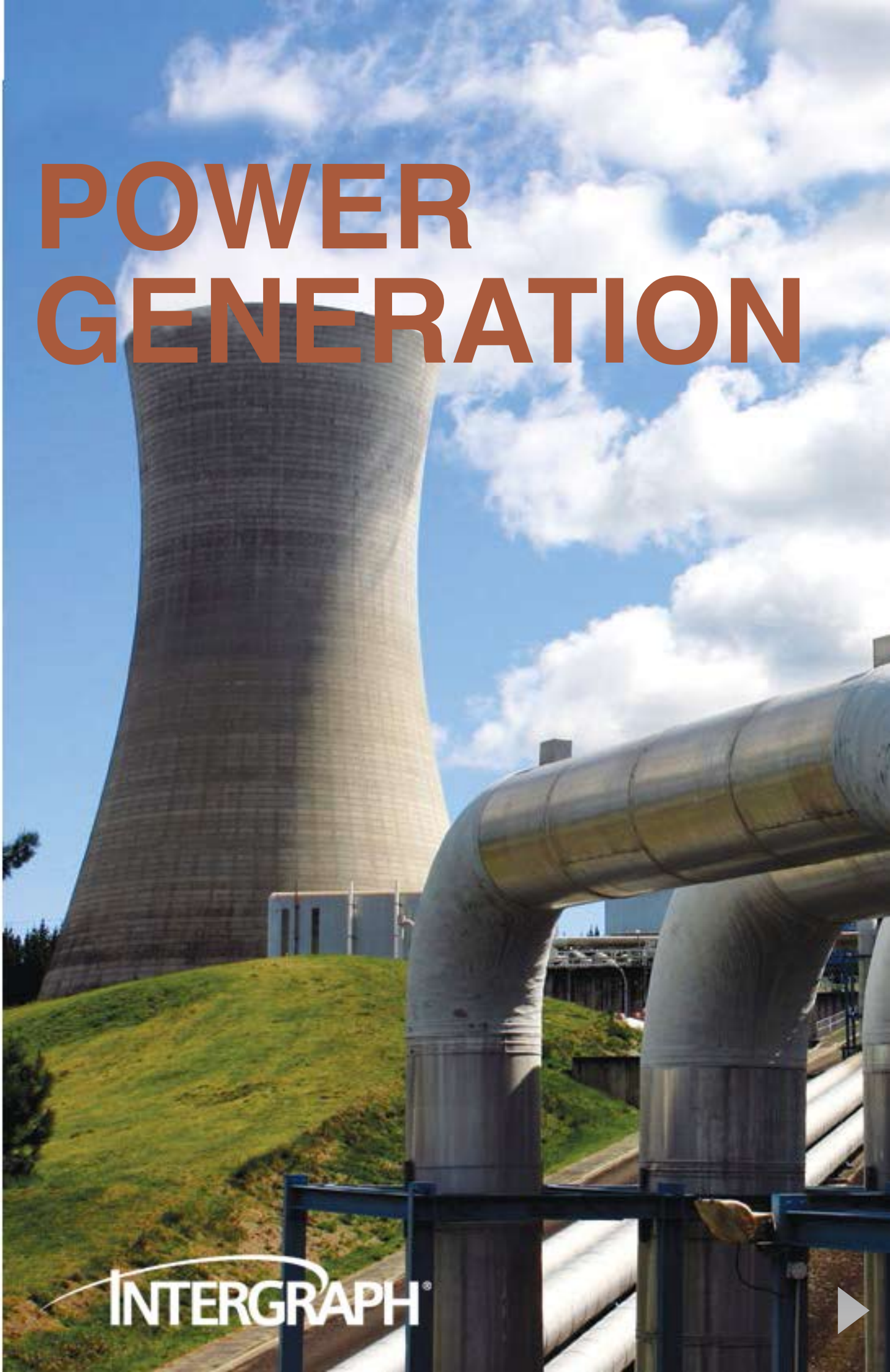
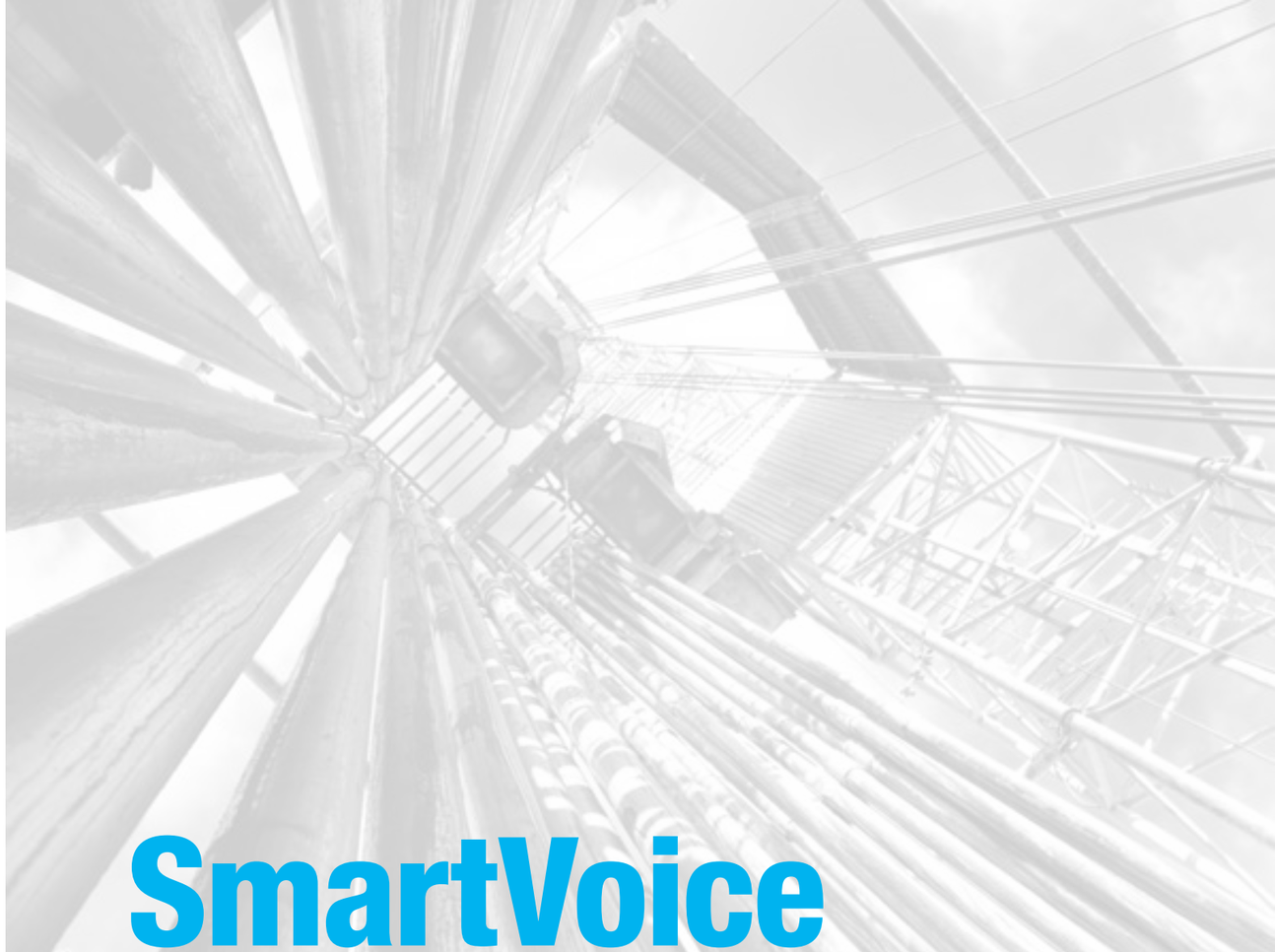
POWER GENERATION



INTERGRAPH®



SmartVoice

Intergraph® Process, Power & Marine Customer Success Stories

VOLUME 2

INTERGRAPH®

INTRODUCTION

Advances and innovations in engineering technology during the last three decades have changed the way people approach their work, the methods and tools they use, the collaborative partnerships they develop, and the solutions they employ to ensure the success of their businesses.

With more than 40 years' history, Intergraph has been helping customers around the world to improve safety, quality, and productivity in their process, power, marine, and offshore facilities. Today, our advanced technology is helping customers change the way they do business by offering solutions that enable them to capture and reuse their intellectual capital across the entire enterprise, enhancing their global competitiveness.

In SmartVoice, you will learn how our customers of all sizes and in all industries are transforming their businesses with Intergraph solutions. Intergraph empowers you to make better, faster operational decisions, leverage best practices from around the world, and explore how other customers are generating more value with Intergraph products and services.

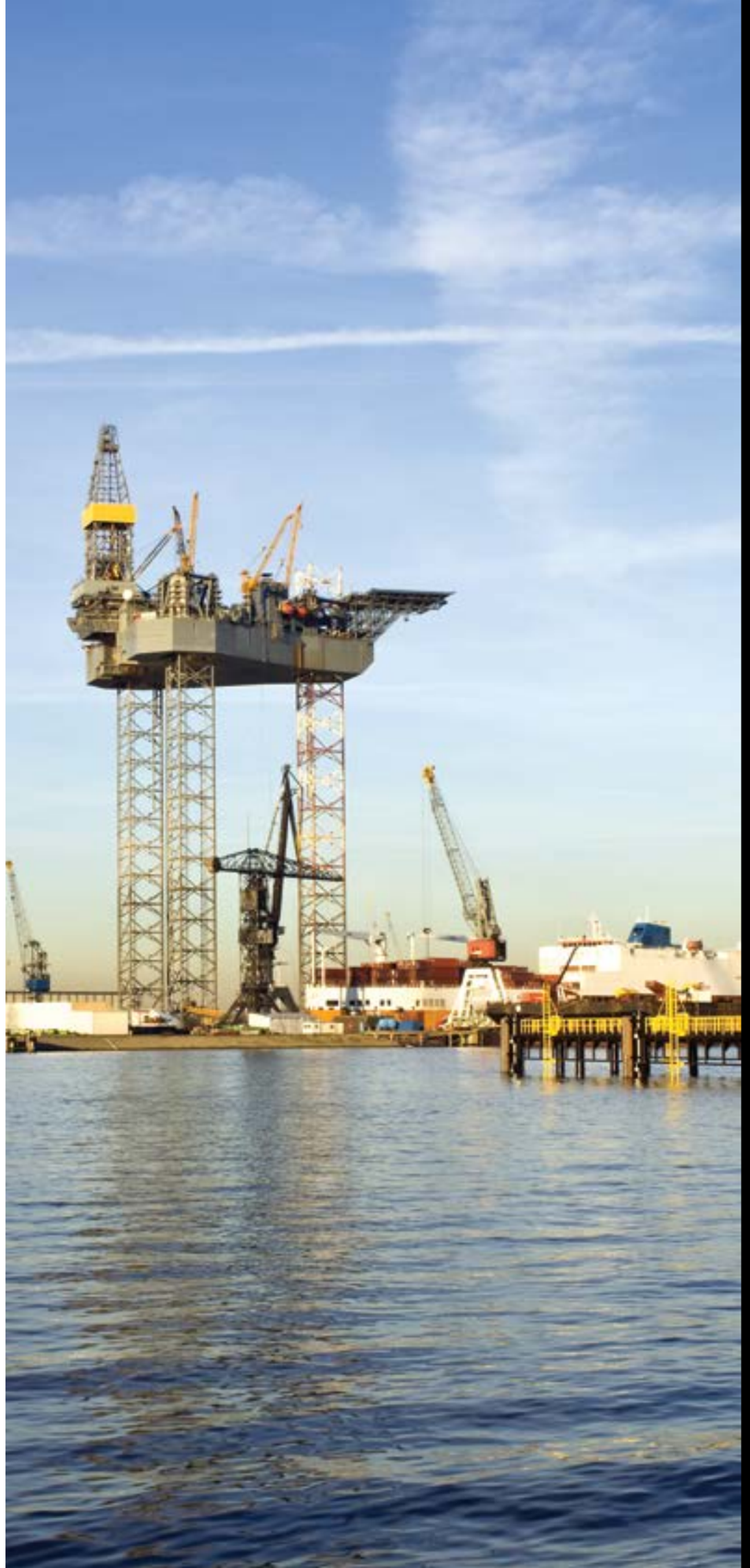
GLOBAL LEADER

Intergraph's Process, Power & Marine division creates solutions that enable the design, construction, and operation of process and power plants, offshore platforms, and ships, and provide the information management capabilities to build and operate those facilities.

Intergraph has been ranked the No. 1 overall worldwide provider of engineering design solutions for industry, according to the ARC Advisory Group. Our leadership position is backed by a proven track record of high-quality product development, a global customer base of industry leaders, and a worldwide sales and support network. Intergraph Process, Power & Marine's business is based on a strong financial foundation and steady growth.

Our customers use Intergraph software and services to design, build, and operate many of the world's largest and most elaborate industrial facilities.

"More than two-thirds of the plants built worldwide are designed using Intergraph software."



HISTORY OF EXCELLENCE

Since offering its first solution for plant design in 1978, Intergraph has focused on developing industry-leading plant and marine design solutions, enabling our customers to use integrated applications to execute projects for increased efficiency and effectiveness. Today, Intergraph is the leading global provider of enterprise engineering software to the process, power, and marine industries. We offer a full suite of solutions that enable proven productivity gains for engineering, procurement, and construction (EPC) firms and owner operators, improving engineering efficiency by up to 30 percent.

1987	Offered our first piping application for plant design.
1984	Launched the leading 3D plant design system.
Late 1990s	Created first data and document management system specifically for the plant design industry.
2000s	Presented suite of integrated, intelligent 2D solutions. Offered leading material management and procurement system specifically for the plant design industry.
Today	Providing the only next-generation 3D solutions for process, power, and marine industries.

INTERGRAPH ENTERPRISE ENGINEERING COMPONENTS

3D MODELING & VISUALIZATION

Save project time and increase production efficiency

For manufacturing and power industries, meeting higher production goals and stricter regulatory requirements begins with building a better plant. Intergraph provides an integrated design environment for plant construction that defines and manages the 3D plant model. The intelligent, rule-based 3D environment enables faster, silo-free plant design and engineering, better collaboration, and reduced time to market. Innovative plant modeling software from Intergraph provides consistent 2D/3D integration between process engineering and detailed engineering disciplines, and true workflow-managed integration across the project enterprise.

INFORMATION MANAGEMENT

Ensure consistency and accuracy of your engineering data

Plant designers and plant owners need plant management software with enhanced decision support capabilities to facilitate global design, production, and life cycle optimization of the plant. Intergraph's information management software maximizes efficiency for industrial and manufacturing plant maintenance and provides plant operation solutions. From concept and design through plant maintenance, operations, and decommissioning, Intergraph enables electronic management of all of the plant's engineering information, integrating information on the physical asset, processes, and regulatory and safety imperatives.

ENGINEERING & SCHEMATICS

Increase data quality and consistency across tasks

To keep a plant operating smoothly over its 30- to 40-year life requires efficient and intelligent plant engineering from the beginning. Intergraph's comprehensive plant engineering solution has been developed for today's 24/7 global engineering workshare environment. All engineering disciplines are intelligent and fully integrated — an engineering change in one area automatically triggers change in all associated objects, no matter where the change occurs. Designed to drive plant optimization, the rule-driven environment prevents engineering errors, thus avoiding shutdowns and lost production.

PROCUREMENT, FABRICATION & CONSTRUCTION

Reduce material surpluses and shortages

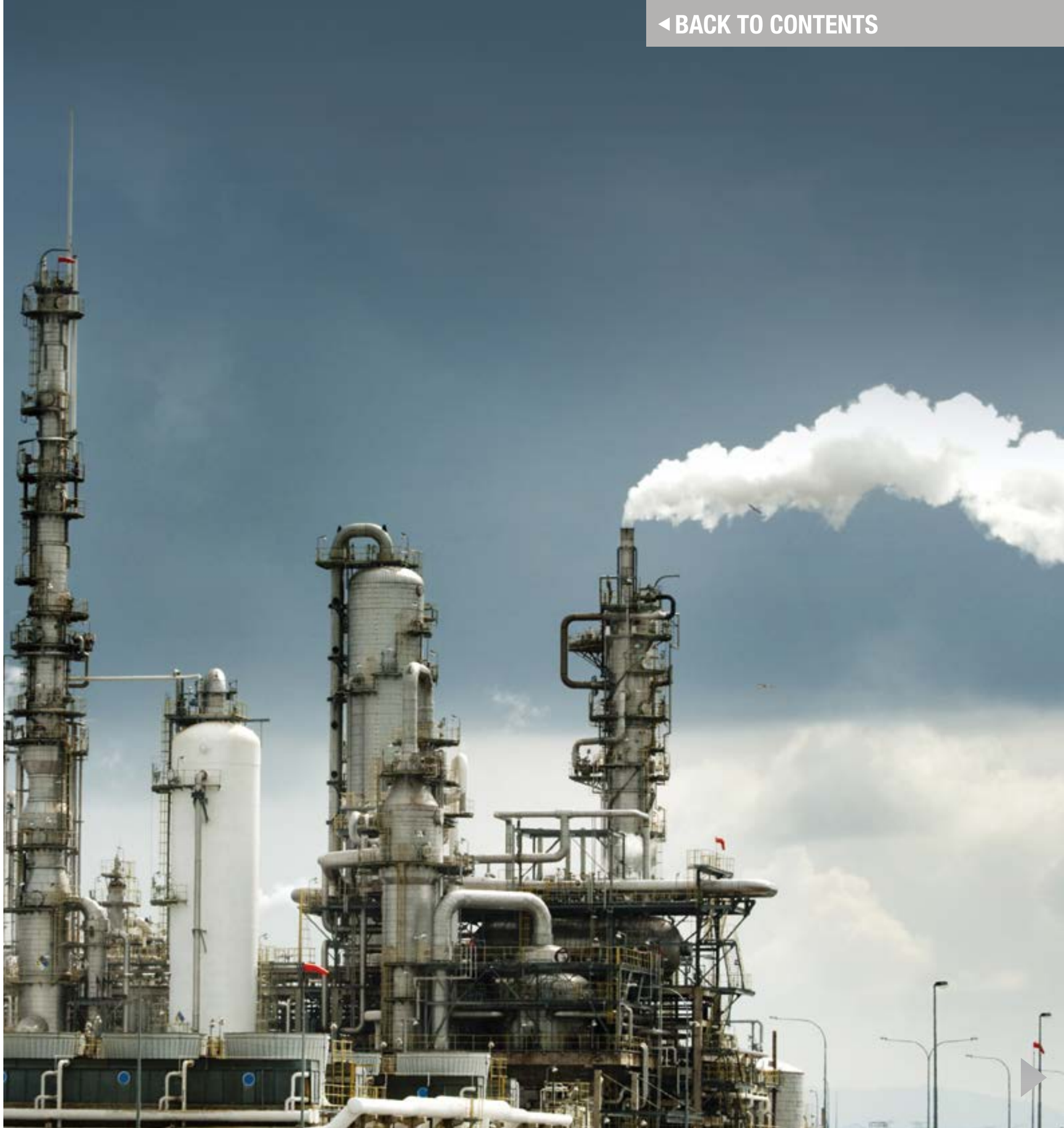
With Intergraph's efficient and accurate plant control system for procurement, fabrication, and construction, plant designers and owners save valuable production time during plant construction. The solution spans the complete project management life cycle — from materials specification and change management through procurement and tracking to inventories, forecast, and material issuing. Intergraph lowers labor costs throughout engineering, procurement, and plant construction. Designed to drive efficiency, our solutions for plant project management can help avoid costly material surpluses and shortages, and reduce overall project risk.

ANALYSIS

Streamline your plant design validation processes

For plant owners and designers, the need to integrate plant design and engineering analysis is vital. One without the other could result in delays and unexpected costs. But with the two working together, you have the ability to validate your plant's design as you go, saving you costly time and resources.

With Intergraph's acquisition of COADE, we now provide plant analysis solutions that set the standard for the industry. Leading plant engineering companies and owner operators worldwide count on our software to deliver accurate, reliable results. Intergraph has transformed primarily manual, time-consuming, and error-prone tasks into seamless and accurate processes. From pipe stress analysis to automated full vessel and oil tank analysis, our software helps you improve safety and reliability while tightening the entire design process to save time and money.



POWER GENERATION

Design, construction, operation, and data management of conventional and nuclear power plants

Intergraph addresses the complete life cycle of large fossil fuel, hydroelectric, or nuclear plants involved in generating power for commercial and residential use. By better understanding the information about the plant, owners can maximize their return on investment to bring a large plant online, improve plant efficiency, and lower power plant operating costs. From new power plant design and construction to nuclear power plant maintenance, owners can benefit from a consolidated and managed source of asset information, such as maintaining effective change control over their valuable plant data.

SmartPlant Enterprise at its Best in Combined Cycle Power Generation Plants

The complete SmartPlant Enterprise suite put to the test of full integration and customization

PROFILE

Company: EMPRESARIOS AGRUPADOS (EA)

Website: www.empre.es

Description: Established in Spain in 1971 and a leader in its field, EMPRESARIOS AGRUPADOS (EA) is an architect-engineering organization of international standing and diversified activity, operating mainly in the areas of Power Generation and Space. EA has provided engineering and consultancy services and carried out full-scope projects in more than 37 countries worldwide.

Employees: 1,000

Industry: Energy

Country: Spain

PRODUCTS USED

- SmartPlant 3D
- SmartPlant Review
- SmartPlant P&ID
- SmartPlant Instrumentation
- SmartPlant Electrical Detailed
- SmartPlant Foundation
- PDS
- CAESAR II

KEY BENEFITS

- Improvement in the overall quality and efficiency of project engineering activities
- Supply of more and better information to EPC contractors during the project life cycle
- Maximization of data quality and usability
- Optimal knowledge sharing
- Single point of access

IDENTIFYING GOALS

EMPRESARIOS AGRUPADOS (EA), one of Spain's largest engineering companies focused on the development of power generation projects, sought to invest in a technology suite that would provide it with competitive advantages in engineering in the longer term and allow it to position itself as a cutting-edge engineering company in the international marketplace.

EA's plant designers and engineering consultants were looking for suitable technology solutions capable of facilitating global design, improving production and optimizing the life cycles of their plants. High-quality design, reliable and centralized data-handling and improved workflows would lead to enhanced engineering activities and better EPC contractor and plant owner decision support capabilities, increasing efficiency during project execution and improving plant operability.

After doing some market research, EA chose the complete suite of Intergraph SmartPlant Enterprise solutions, being one of the first international companies to do so. The SmartPlant Enterprise portfolio suite is helping EA improve the development and implementation of engineering projects, especially for combined cycle power generation and nuclear power plants.

OVERCOMING CHALLENGES

- Gain quality, efficiency and productivity through the automation of activities and the integration and scalability of engineering processes
- Leverage project information and knowledge during all phases of design, procurement, construction operation and maintenance
- Optimize data collection, data sharing and data management
- Integration across the workflow using high-quality, reliable data

REALIZING RESULTS

Customizing Intergraph products has proven essential for EA, as it has provided the company with competitive advantages in the engineering market. This customization consists in optimizing the information output of all the available data through automatic data calculation, data checking using self-generate tables, catalogue development, use of different symbologies and component identification systems, and automation of data-sheets, among other activities. Data is then outlined in the maps used throughout the project cycles. In addition, reliable database reports and drawings are easily being created.

Workflow improvement has focused on integrating data and information from all the different disciplines that previously worked more independently on a project. Following this integration, all disciplines now share all data generated, which is helping reduce design errors, bring forward project schedules and facilitate decision making.

EA is currently developing eight projects using SmartPlant 3D and SmartPlant P&ID. Worth mentioning due to its size and relevance is a combined cycle power generation plant project under way in North Africa, whose SmartPlant 3D database now contains more than 22 GB of data and over 1,160,000 entries. Four other projects in Europe and the Middle East are being developed with SmartPlant Enterprise.

EA is now focusing its efforts on optimizing the implementation of SmartPlant Electrical Detailed (formerly SIGRAPH), customizing the product to meet its needs and working on enhancing its interface, so as to better integrate it with other systems and products. Moreover, product development research is diving deeper into improving the integration of SmartPlant Foundation with SmartPlant Instrumentation and SmartPlant 3D. All new projects undertaken by EA in the future will be developed under the customized full SmartPlant Enterprise platform.

MOVING FORWARD

In support of its commitment to improvement and fostering innovation, EA will seek to further customize Intergraph's products. The company has already experienced productivity increases using SmartPlant 3D for plant design purposes, and will pursue further simplification of the administration tasks tied to product usability.

Once all of its combined cycle power generation plants are being developed and operated under SmartPlant Enterprise, EA will move to implement the technology into its nuclear power plant projects. EA was the architect engineer of four Spanish nuclear power plants. The company continues to work in nuclear design modification activities for NPPs currently in operation and in the development and licensing processes of new international nuclear power plant projects.

www.empre.es

EMPRESARIOS AGRUPADOS

The Power of Collaboration

SmartPlant 3D and SmartPlant Foundation boost modern power plant projects

The China Power Engineering Consulting Group Corp. (CPECC) East China Electric Power Design Institute (ECEPDI) is ranked as one of the 100 most powerful engineering companies in China.

ECEPDI recently designed the Cadillac Green Energy Development Co., Ltd. biomass power plant engineering 30MW unit in Jinzhai county in the Anhui province and the Cadillac 30MW unit in Songtao county in the Guizhou province. ECEPDI chose SmartPlant Foundation and SmartPlant 3D for the design and implementation process of the digital power plants.

Before the projects began, the design team had its doubts about using the new design software. The team worried that the SmartPlant Enterprise software architecture and development direction would not be able to support the digital plant design goals for the future. But those fears soon proved to be entirely unfounded. Intergraph design software helped ECEPDI do more and meet stricter requirements.

ECEPDI now uses SmartPlant 3D, SmartPlant P&ID, SmartPlant Instrumentation, SmartPlant Electrical, SmartPlant Foundation and SmartPlant Reference Data. With unified integration and a powerful design environment, ECEPDI achieves automatic 2D and 3D calibration of its engineering data. Data inconsistencies are highlighted, greatly enhancing fully digital plant design.

With SmartPlant 3D, ECEPDI has gained:

- A substantial increase in design quality and efficiency.
- Approximately 20 percent reduction in construction and installation engineering costs.
- Total project investment savings of 3 percent to 5 percent.

The team can work in real-time, taking advantage of quality control for design work. All disciplines can focus on design and content, improving the quality of design to deliver optimized design.

With collaborative design, professionals across many workflows can benefit from the modeling process to design and achieve a single representation of reality. As design collaboration is repeated, it improves design efficiency and quality, and lays the foundation for the transfer of digital data back to the owner for operations and maintenance.

DESIGN DATA MANAGEMENT

In power plant design, there are upstream and downstream processes. SmartPlant Foundation receives design data released by the upstream design software. After system checking and confirmation, data is exported from SmartPlant Foundation to the downstream design software. This effectively avoids data entry errors, reducing labor hours and improving design efficiency.

Part of the value of SmartPlant Foundation is found during plant operations. The original data is stored as model attributes or in the form of data tables in SmartPlant Foundation to support operations and maintenance activities.

DESIGN DOCUMENT MANAGEMENT

ECEPDI has customized the SmartPlant Foundation document management process to store not only various types of finished design drawings and unified management reports, but also to document the extended scope for early raw data and intermediate files in the design process. Documents of all kinds can be validated and distributed with the SmartPlant Foundation platform. By replacing the traditional paper method to process information, the software eliminates the need for printing and manual distribution and provides data protection through versioning and traceability.

SmartPlant Foundation does not manage stored data or documents in an isolated manner. All 2D and 3D data is interrelated through the power plant identification system code, so that the entire data retrieval process is targeted, efficient and intuitive.

EARLY DESIGN INFORMATION ACCESS

SmartPlant Foundation acts as a unified management platform. Plant design content and progress can be monitored with real-time response through the software's rights management for the open query functionality. Customers can always visit the SmartPlant Foundation master design schedule and browse the 3D model without having to wait until the finished product delivery.

This gives users an intuitive engineering and construction process to analyze any differences between the design and as-built. At the same time, through the 3D model, owners can carry out related functions of the building and construction process to further assess any issues that may arise and resolve them quickly.

EXPAND THE RANGE OF LAYOUT, IMPROVE DESIGN ACCURACY

The new 3D digital layout design is no longer confined to the main plant role, but has expanded its scope for comprehensive coverage to include turbine, boiler, coal, ash, chemical, hydraulic, civil, electrical and instrumentation workflows. The 3D arrangement covers the entire plant, including built structures and other areas. In this way, layout design considerations will be more comprehensive, systematic and global. Designers can maximize the use of space, optimizing clearance and enhancing layout design.

SmartPlant 3D helped ECEPDI to expand the scope of 3D layout design to improve design accuracy. The installation unit can arrange for small pipe installation based on the latest design. The team can now advance more quickly to the design phase. SmartPlant 3D helps ECEPDI to improve the effectiveness of its planning so small piping can be placed more efficiently.

Not only does it enhance 3D layout design, but it also helps the team more accurately complete cable laying. The cable tray can be filled more adequately to reduce the amount of bridge material and wasted space.

EFFECTIVE COLLISION CONTROL

With the expansion of the 3D layout design scope, the 3D model can truly reflect the power plant. In the past, collisions could only be detected during the construction phase, but now they can be located and resolved earlier, during the design stage. SmartPlant 3D offers superior collision detection, combined with automatically generated collision reports and collision control in the design phase. This reduces the amount of rework during the construction phase, speeding up the construction schedule and reducing material waste.

UPSTREAM AND DOWNSTREAM DATA CONSISTENCY

With the data management platform, process system design results are passed to the process piping layout design. SmartPlant 3D offers layout design without the need for manual entry. Users can avoid data inconsistencies arising from the design of intermediate links. This improves the accuracy of input data to effectively guarantee design quality.

ENHANCED LAYOUT

After long-term use of Intergraph technology, ECEPDI enjoys 3D coordination of the engineering workflow. With layout design in a 3D environment, users can take advantage of the fully intuitive software to visualize the surrounding layout and improve the accuracy of the model. This includes the object's spatial location and size. The civil engineering group can base its work on this data and direct the subsequent selection of design. Data transfer without manual intervention ensures data accuracy and reduces the possibility of design errors.

OPTIMIZED PBS STRUCTURE

An optimized plant breakdown structure (PBS) can adapt to the needs of the various objects in project management. The PBS for SmartPlant 3D offers a simple-to-understand directory structure for the storage of all digital design objects. ECEPDI has formed a clear, reasonable structure for convenient model retrieval. This meets various classification needs so that the finished content can be made available in the future with even more diverse combinations. The pipeline design of the finished product can be accurate to:

- A single pipeline
- Materials, depending on the type of aggregate
- Unit, such as a single building or multiple buildings
- A single system or multiple systems

This capability helps ECEPDI to meet the different needs of various parties, such as procurement, subcontractors and material distribution.

www.ecepdi.com

IMR Hamburg Uses SmartPlant Spoolgen Plus to Boost Productivity for Power Projects

Intergraph piping technology delivers cost savings and high-quality documentation handover to power plant construction projects

PROFILE

Company: IMR Hamburg GmbH

Website: www.imr-hamburg.com

Description: IMR Hamburg specializes in the supply of pipelines for power stations and industrial facilities in Germany and Europe. It provides construction and maintenance of industrial piping, equipment erection, and materials logistics solutions for power plants and process industries. IMR Hamburg is particularly well-known in the high-pressure area, processing all kinds of materials from high-alloyed metals to plastics, and produces pipelines in a broad range of sizes and specifications.

Industry: Power

Country: Germany

PRODUCTS USED

- SmartPlant Spoolgen Plus

KEY BENEFITS

- Elimination of inefficient manual work practices
- Accelerated execution of piping projects for reduced costs
- Efficient revision handling
- On-demand progress reporting
- Complete material and weld traceability
- Compliance with project engineering and quality assurance standards (European PED 97/23/EC)
- Automated production of as-built piping isometrics, welding, and final quality assurance documentation

IDENTIFYING GOALS

IMR Hamburg GmbH (IMR Hamburg) specializes in the construction of high-specification, high-pressure pipelines for power stations and industrial facilities across Germany and Europe. Its unwavering commitment to quality and customer service has helped the company to win several major power piping contracts, involving the fabrication and erection of thousands of pipelines at various sites across Europe.

With more complex project scopes to satisfy, increasing numbers of pipe spools to manufacture and erect, and significantly more welds to test and certify, it was becoming increasingly challenging to deliver such large-scale projects on schedule and within budget. As such, IMR Hamburg decided to re-evaluate its existing business processes and improve its working methods.

IMR Hamburg had previously been operating an entirely paper-based work process on site. For example, to manage materials, track welds, and report progress, various spreadsheets were used. To produce final as-built handover documentation, design isometrics received from the engineering contractor that were subsequently marked up in the field were re-drafted in 2D CAD, with each sheet taking up to four hours to complete.

Such traditional methods were not only manually intensive, but also extremely time-consuming, expensive, and error-prone. IMR Hamburg determined that it needed to leverage intelligent technology to improve its efficiency and productivity.

OVERCOMING CHALLENGES

- Reduce dependency on paper as the primary communication medium
- Eliminate time-consuming and expensive manual CAD drafting
- Enhance management of design revisions for improved quality and accuracy
- Improve productivity for enhanced competitiveness

REALIZING RESULTS

IMR Hamburg sought a software solution that was capable of receiving electronic piping design data output by its clients' design systems, as well as allow it to work efficiently with design isometrics. After an extensive evaluation of the available solutions, IMR Hamburg decided to implement Intergraph SmartPlant Spoolgen Plus (SmartPlant Isometrics, Spoolgen-Piping, and Spoolgen-Welding), which is powered by ISOGEN.

SmartPlant Spoolgen Plus receives electronic piping data in IDF or PCF format from upstream design systems, such as Intergraph's SmartPlant 3D and PDS (used by IMR Hamburg's clients), as well as all major third-party 3D design systems that use ISOGEN. Isometrics for construction (IFC) are automatically produced by these 3D design systems using ISOGEN, making SmartPlant Spoolgen Plus the perfect fit.

"Using SmartPlant Spoolgen Plus, we are able to work with our client design information and manage all piping data centrally in a database," said Andre Koehsel, head of quality assurance (QA) and welding technology at IMR Hamburg. "With the user-friendly tools provided in SmartPlant Spoolgen Plus, we are able to create documentation that is more accurate and of better quality. This is all done much faster and more easily than we could before."

The implementation of SmartPlant Spoolgen Plus has delivered great benefits to IMR Hamburg. For each pipeline that the company erects, it is obligated, under contract, to hand over to its client a complete as-built record, including as-built isometrics, welding documentation with non-destructive testing results, radiography films, and final QA certification. The creation of these documents, in accordance with the Pressure and Equipment Directive (PED), used to be a very time-consuming process, particularly for some projects that could have more than 2,000 pipelines. SmartPlant Spoolgen Plus has significantly enhanced this process and increased IMR Hamburg's productivity, helping the whole on-site team (about 50-60 personnel) work more efficiently and cohesively.

Koehsel said, "In the past, for each pipeline we installed, it could take up to one hour to create final certification. It now takes us just a couple of minutes, which is a very impressive man-hour saving for a 2,000-line project!"

Production of as-built isometrics is also very easy now. The IDF received from the client is imported to create an editable sketch, which is then altered in line with the marked-up isometric received from the field. Finally, the as-built isometric is automatically generated via ISOGEN. Compared to traditional 2D CAD drafting, IMR Hamburg is now saving about two to three hours per isometric.

Managing design revisions is also no longer difficult and problematic. With SmartPlant Spoolgen Plus, changes made to the physical pipe design or to the underlying process data received via the line list are detected automatically and can be visualized graphically, helping IMR Hamburg to manage change systematically. This has eliminated manual checking and helped to reduce wastage. It has also minimized disruption to production and the project schedule.

Koeshel said, "When IMR Hamburg hands over the final as-built record to our clients, we have complete trust in the accuracy of the documentation we provide because it was created based on the last revision of the piping data stored in the database."

MOVING FORWARD

SmartPlant Spoolgen Plus has significantly improved IMR Hamburg's operating efficiency, profitability, and competiveness.

"SmartPlant Spoolgen Plus has delivered an average saving of 10 hours processing time per pipeline," said Koehsel. "IMR Hamburg intends to use SmartPlant Spoolgen Plus as our standard methodology on all piping construction projects we execute in the future."

IMR HAMBURG

www.imr-hamburg.com

PipeServ Engineering Achieves Success on Greek Power Project with CADWorx, CAESAR II, and PV Elite Integration

Headquartered in Athens, Greece, PipeServ Engineering provides engineering services to the oil and gas industries, including petroleum refining, and for to power generation and other heavy industries. TUV Austria Hellas chose PipeServ for the design of a series of combined cycle power plants in Greece that involved engineering and design for piping and supports within the plant facility and for auxiliary systems, large bore hot and cold pipelines involving 2,500 supports, 300 spring hangers, a pipe rack and steel structures. PipeServ performed stress analysis for small bore hot pipelines and finite element analysis for buried circulating water pipelines of 2.5m in diameter. They also provided mechanical design and construction drawings for three tanks and seven pressure vessels, including construction drawings.

ACHIEVING QUICK PRODUCTIVITY WITH EASY START UP

PipeServ achieved success on the project with Intergraph CADWorx Plant Professional and CADWorx P&ID Professional for plant design and process and instrumentation diagrams integrated with Intergraph CAESAR II and PV Elite for analyzing and designing piping and vessels. “The advanced capabilities of this easy-to-use and proven solution provided fast project set up and a quick learning curve with almost immediate productivity,” explained Antonis Markogiannakis, CEO of PipeServ, “and we also benefited from the easy customization of databases and efficient coordination among specialties.”

SPEEDING REVIEW AND COMPLETION WITH INTELLIGENT 3D MODELING

The seamless integration between engineering and design improved productivity. They were able to provide CAESAR II pipe stress models instantly and reliably from the same model, and with the integration of PV Elite, they could analyze and complete the design of the pressure vessels with ease. The integration between 2D drawings and the 3D model expedited the work flow for all involved, and the 3D modeling capabilities improved the design quality by allowing better concept generation and easier reviews and checking between collaborators and the client. “We could easily share information that was always up-to-date by simply sharing the model,” Markogiannakis added.

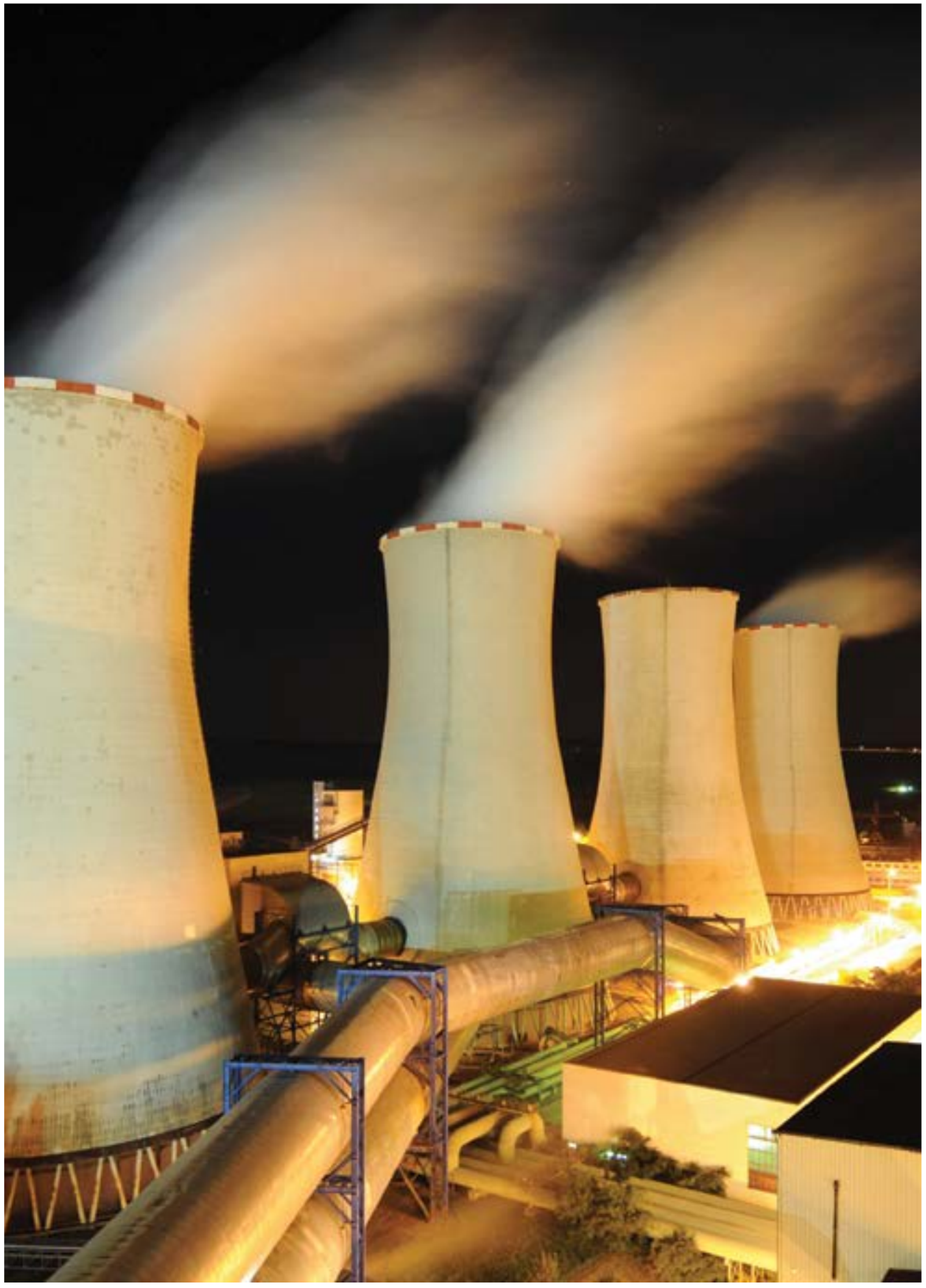
AUTOMATING DELIVERABLES FOR QUICKER COMPLETION

Leveraging the capabilities and intelligence built into Intergraph CADWorx for design combined with CAESAR II and PV Elite for analysis, Pipeserv was able to automate the production of deliverables with aped and accuracy. They generated isometric drawings automatically with minimum post processing required, and the software’s batch generation capabilities improved the quality of the drawings and reduced the amount of time required. They also produced instant bills of material that were accurate and complete, all from one model.

SAVING TIME THROUGH INTEGRATION COMBINED WITH AUTOMATION

PipeServ provided the client with reliable, high quality and accurate deliverables in less time. That is possible because the CADWorx 3D model provides true intelligence and full integration with engineering analysis. The model and its associate data are always up-to-date and provide a complete and accurate depiction of the facility design at all times. Once the model was completed, PipeServ could then produce automatic isometric drawings and bills of materials with full confidence.

www.pipeserv.gr



SmartPlant 3D Helps Rekadaya to Enhance Design of Power Plants for Increased Performance

Next-generation Intergraph 3D design solution enables Indonesian engineering company to achieve improved safety, quality, and productivity

PROFILE

Company: PT Rekadaya Elektrika

Website: www.rekadaya.co.id

Description: Rekadaya was founded by two companies: PT PLN (Persero) and PT Rekayasa Industri. It was established to increase and improve competitiveness of electric power projects in Indonesia. Rekadaya specializes in power plants and related network infrastructure, with its EPC solutions designed to give its customers a competitive advantage. From small power plants to enterprise-wide integrated systems, Rekadaya's solutions have proven themselves across a wide range of power plants, and in some of the most demanding power environments.

Industry: Power

Country: Indonesia

PRODUCTS USED

- SmartPlant 3D
- SmartPlant Review
- SmartPlant Reference Data
- Standard Database for SmartPlant Reference Data
- CAESAR II

KEY BENEFITS

- Capture of accurate engineering knowledge for enhanced competitiveness
- Design automation for increased modeling productivity and design quality
- Concurrent engineering across multiple disciplines for enhanced collaboration

IDENTIFYING GOALS

Indonesia represents a huge market for the development and construction of power plants and related network infrastructure to meet the rising demand for electricity in line with the increasing momentum of the country's economic growth. PT Rekadaya Elektrika (Rekadaya) was established to respond to market demand on the development of electric power projects. The Indonesian company offers EPC solutions for a wide range of power plants.

As the power sector in Indonesia continues to grow, Rekadaya wanted to update its technology systems to keep up with an increasing number of projects and maintain its competitive advantage. The Indonesian EPC determined that it needed to leverage the latest and most advanced technology to enhance power plant design and deliver maximum engineering value.

OVERCOMING CHALLENGES

- Improve engineering design productivity and accelerate project schedules
- Enhance quality and accuracy of engineering design
- Automate generation of project deliverables

REALIZING RESULTS

After a comprehensive evaluation of all the available solutions in the market, Rekadaya selected Intergraph SmartPlant 3D as the best option for its requirements.

"We needed an engineering design solution that could improve our productivity and accelerate project schedules for enhanced competitiveness," said Isfa Musafik, lead drafter at Rekadaya. "SmartPlant 3D is proven technology, and has been adopted by several of our clients. The Intergraph solution features unique rule-based architecture and automation capabilities, which will help to optimize our engineering design processes."

SmartPlant 3D is the world's first and only next-generation 3D plant design solution, employing a breakthrough engineering approach that is focused on rules, relationships, and automation. It provides all the capabilities needed to design a plant, and then keep it as-built throughout its life cycle. This innovative Intergraph solution captures new and existing engineering knowledge so that it can be saved and reused in the future, which is key to Rekadaya's success in today's competitive global economy. SmartPlant 3D is the most advanced and productive 3D plant design solution that effectively enables optimized design for increased safety, quality, and productivity, while shortening project schedules. Companies using SmartPlant 3D typically report a 30 percent improvement in overall engineering design productivity.

Intergraph and PT Everest Technology, our local distributor in Indonesia, supported the implementation of SmartPlant 3D for engineering design at Rekadaya. The Indonesian EPC was impressed by SmartPlant 3D's user-friendly and powerful interface across all engineering disciplines, supporting concurrent engineering by multiple users across multiple disciplines for enhanced collaboration. SmartPlant 3D's rule-based technology facilitates design automation and interdisciplinary clash checking for faster and better design. The Intergraph solution also includes all international standards and codes, which is particularly important for the power industry. In addition, Rekadaya could use SmartPlant Review for internal assessment of 3D models, as well as review them with clients.

Another critical factor for Rekadaya's selection of SmartPlant 3D was its ability to interface with other applications within an integrated engineering environment. Rekadaya is already interfacing SmartPlant 3D with CAESAR II for pipe stress analysis, and the solution can allow for future expansion as it also integrates with other SmartPlant Enterprise solutions across all engineering disciplines, including materials management, engineering and schematics, and others.

MOVING FORWARD

Rekadaya intends to expand its use of SmartPlant 3D and implement it for additional projects. The Indonesian EPC also plans to establish an integrated engineering environment by adopting other SmartPlant Enterprise solutions, such as SmartPlant Foundation, SmartPlant Instrumentation, SmartPlant Materials, SmartPlant Electrical, and SmartPlant P&ID.

"We have had a positive experience with the use of Intergraph technology and we are confident it will deliver great value to our company," said Musafik. "The adoption of the integrated suite of SmartPlant Enterprise engineering solutions will enable us to fully maximize the benefit of SmartPlant 3D for our power plant projects."

www.rekadaya.co.id

SNERDI Integrates Engineering Disciplines with 3D Design for Nuclear Power Projects

Chinese nuclear research and design institute implements SmartPlant Enterprise solutions in global workshare environment

PROFILE

Company: Shanghai Nuclear Engineering Research and Design Institute

Website: www.snerdi.com.cn

Description: Established in 1970, SNERDI is a high-tech enterprise subsidiary of the State Nuclear Power Technology Corporation. It is a key research and design institute with expertise in nuclear electric power technology, and leads the industry in China. The business scope of SNERDI is plant design, EPC contracting, project consulting, equipment research and design, project management, equipment procurement, technology development, and engineering services.

Employees: Over 1,200

Industry: Nuclear

Country: China

PRODUCTS USED

- SmartPlant Instrumentation
- SmartPlant Electrical
- SmartPlant P&ID
- PDS

KEY BENEFITS

- Global, concurrent engineering to support multiple nuclear power plant projects
- Integrated engineering environment across all disciplines for complete nuclear power design
- Improved quality and efficiency of engineering design and project management

IDENTIFYING GOALS

Shanghai Nuclear Engineering Research and Design Institute (SNERDI) is the leading technology research and design institute for nuclear electric power in China. SNERDI is responsible for the engineering and design of several nuclear power plant projects in China and overseas. This includes Westinghouse AP1000 nuclear projects, such as the Sanmen and Haiyang nuclear power plants in China and Chasma Unit 2 in Pakistan.

SNERDI has a long association with Westinghouse, having produced 3D plant models to support Westinghouse's AP1000® plant design, which is recognized as among the safest and most advanced nuclear power plants on the market today. It is based on standard Westinghouse pressurized water reactor (PWR) technology that has achieved more than 2,500 reactor years of highly successful operation. Modular in design, the AP1000 promotes ready standardization and high construction quality. It is also designed to be economical to construct and maintain, while promoting simplicity and ease of operation.

To continue driving its expertise in nuclear power plant design and support an increasing number of global projects, SNERDI decided that it needed to move away from traditional design methods and leverage intelligent, advanced technology to support an integrated design platform.

OVERCOMING CHALLENGES

- Establish integrated engineering design platform with 2D engineering and schematics and 3D design
- Support multiple nuclear power projects concurrently in a global workshare environment
- Improve quality of engineering design and overall project productivity

REALIZING RESULTS

SNERDI has been an Intergraph customer since 1997 and it selected SmartPlant Enterprise engineering solutions to improve its design processes for its global nuclear power projects. SmartPlant Enterprise offers true engineering integration, enabling SNERDI to establish and develop an integrated design platform to enhance global collaboration and meet project requirements.

SmartPlant Enterprise offers a powerful portfolio of industry-leading, best-in-class design and data management solutions, enabling SNERDI to capture integrated engineering knowledge at the enterprise level for the competitive advantage needed in today's and tomorrow's market. SmartPlant Enterprise's integrated suite of solutions enables proven productivity gains, improving engineering efficiency by up to 30 percent. This is why the majority of plants built worldwide are designed using Intergraph solutions.

By integrating SmartPlant Engineering & Schematics applications (such as SmartPlant Instrumentation, SmartPlant Electrical, and SmartPlant P&ID) with 3D design, SNERDI is able to complete engineering design for its nuclear power plants across all disciplines. The integrated engineering environment enables SNERDI's engineers to perform global, concurrent engineering for multiple projects, improving the quality and efficiency of the design work involved.

For example, the integration of SmartPlant P&ID with the 3D design platform enables SNERDI's engineers to quickly view the relevant P&ID data and generate the associated reports, without having to refer to a large number of documents separately. The integration also improves the consistency and accuracy of the data, which can be reused with other engineering applications to minimize errors.

Gu Guoxing, vice president at SNERDI, said, "The strong growth of our business requires reliable design and engineering solutions that improve our productivity significantly so that we can achieve a competitive advantage on the international market. Intergraph's SmartPlant Enterprise suite satisfies this demand because it provides leading technology coupled with strong local and international support to achieve optimized benefits from our investment."

MOVING FORWARD

SNERDI has been a longtime Intergraph customer and will continue expanding its use of SmartPlant Enterprise solutions for further productivity and interoperability benefits. The Chinese research and design institute remains committed to using Intergraph technology and will leverage SmartPlant Enterprise's full range of integrated design and engineering solutions to meet the needs of nuclear power plant projects in China and around the world.

www.snerdi.com.cn

ABOUT INTERGRAPH

Intergraph is the leading global provider of engineering and geospatial software that enables customers to visualize complex data. Businesses and governments in more than 60 countries rely on Intergraph's industry-specific software to organize vast amounts of data to make processes and infrastructure better, safer and smarter. The company's software and services empower customers to build and operate more efficient plants and ships, create intelligent maps, and protect critical infrastructure and millions of people around the world.

Intergraph operates through two divisions: Process, Power & Marine (PP&M) and Security, Government & Infrastructure (SG&I). Intergraph PP&M provides enterprise engineering software for the design, construction, operation and data management of plants, ships and offshore facilities. Intergraph SG&I provides geospatially powered solutions, including ERDAS technologies, to the public safety and security, defense and intelligence, government, transportation, photogrammetry, and utilities and communications industries. Intergraph Government Solutions (IGS) is a wholly owned subsidiary of Intergraph Corporation responsible for the SG&I U.S. federal business.

Intergraph is part of Hexagon (Nordic exchange: HEXA B; www.hexagon.com), a leading global provider of design, measurement, and visualization technologies that enable customers to design, measure and position objects, and process and present data.

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